ARTICLE 33-34

PETROLEUM PRODUCTS

CHAPTER 33-34-01
SPECIFICATIONS AND STANDARDS FOR PETROLEUM PRODUCTS

33-34-01-01. Analytical specifications.

1. **Gasoline specifications.** Gasoline specifications are listed and described in the appendix to this chapter labeled North Dakota gasoline specifications. Gasoline must meet the specifications in the appendix.

2. **Gasohol specifications.** Gasohol is a motor fuel composed of ninety volume percent of unleaded gasoline meeting all of the requirements of the North Dakota gasoline specifications except for those regarding octane and ten volume percent of denatured ethanol meeting the requirements detailed in subsection 5. The final product must meet the octanerequirements of the North Dakota gasoline specifications.

3. **Leaded gasohol specifications.** Leaded gasohol is a motor fuel composed of ninety volume percent of leaded gasoline meeting all of the requirements of the North Dakota gasoline specifications except for those regarding octane and ten volume percent of denatured ethanol meeting the requirements detailed in subsection 5. The final product must meet the octane requirements of the North Dakota gasoline specifications.

4. **Alternative specifications.** A permitted alternative is gasohol or leaded gasohol prepared by the addition of a nominal ten volume percent of denatured ethanol meeting the requirements of subsection 5 to an unleaded or leaded gasoline, respectively, that may not meet the requirements of the North Dakota gasoline specifications, provided that the finished product does meet the North Dakota gasoline specifications.

5. **Alcohol specifications.** The denatured ethanol at the time of blending either gasohol or leaded gasohol must contain no more than one and twenty-five one-hundredths weight percent of water. It shall be made unfit for beverage use by the addition of noxious or toxic materials (denaturants), as required by the United States department of treasury, bureau of alcohol, tobacco, and firearms.

6. **Permissible levels of alcohol.** The maximum permitted level or levels of ethanol, methanol, or other alcohol, in gasoline or gasohol must be in accord with any levels as established by the environmental protection agency of the United States department of the interior. Any blender or wholesaler distributing a gasoline containing methanol which has been granted an exemption or waiver by the environmental protection agency in reference to this section shall inform the state department of health and consolidated laboratories and the retailer of the blended product of this exemption or waiver in writing prior to distribution.

History: Effective August 1, 1988.
General Authority: NDCC 19-10-10, 23-01-03(3)
Law Implemented: NDCC 19-10-10

33-34-01-02. Labeling specifications.

1. **Posted octane rating**. The posted octane rating of a gasoline or gasohol is the mathematical average of the octane as determined by the ASTM Research Method and the octane as determined by the ASTM Motor Method.

   a. The posted octane rating must appear on the dispenser's front panel in a type not less than one inch [2.54 centimeters] high.

   b. Only gasoline or gasohol with a posted octane rating greater than or equal to ninety-one may be labeled "premium".

   c. Only gasoline or gasohol with a posted octane rating greater than or equal to eighty-nine may be labeled "super" or "midgrade".

   d. Octane of unleaded and leaded gasoline or gasohol must be at least eighty-seven. Unleaded gasoline or gasohol means that gasoline or gasohol produced without the use of any lead additive and which contains not more than five one-hundredths grams of lead per gallon and not more than five one-thousandths grams of phosphorus per gallon. Leaded gasoline or gasohol means gasoline or gasohol produced with the use of any lead additive or which contains more than five one-hundredths grams of lead per gallon or more than five one-thousandths grams of phosphorus per gallon.

2. **Alcohol-blended gasolines.**

a. All gasoline or gasohol sold or offered for sale containing ethanol, methanol, or cosolvent alcohol, or any combination thereof, shall be labeled with the conventional name or names of the alcohol contained in the gasoline or gasohol if the gasoline or gasohol consists of one percent or more by volume of any alcohol or combinations of alcohols. The label must be on any price advertising and the dispenser's front panel in a position that is clear and conspicuous from the driver's position.

b. Maximum percentage of methanol and cosolvent alcohol must both be conspicuously displayed or labeled if the product contains three percent or more by volume of methanol.

c. No person may sell gasoline or gasohol in any manner, including coloring, which shall deceive, tend to deceive, or has the effect of deceiving the purchaser as to grade or type.

d. Suppliers of alcohol-blended gasoline to retail service stations or to other resuppliers must provide to the retailer or other reseller an invoice or delivery ticket indicating to within one percentage point the specific content by volume of any alcohol contained if the gasoline or gasohol consists of one percent or more by volume of any alcohol or combinations of alcohols. This information must be made readily available to the consumer of an alcohol-blended gasoline.

3. **Gasoline grade designations**. All gasolines or alcohol-blended gasolines sold or offered for sale must bear on the dispenser's front panel and on any price advertising the appropriate leaded or lead free grade designation. This label must be posted in a position that is clear and conspicuous from the driver's position.

History: Effective August 1, 1988; amended effective August 1, 1989; February 1, 1992.
General Authority: NDCC 19-10-10, 23-01-03(3)
Law Implemented: NDCC 19-10-10

33-34-01-03. Kerosene specifications. Kerosene shall meet the specifications of this section.

1. Kerosene shall be a petroleum fraction, shall be free from water, additives, foreign and or suspended matter, and shall be suitable for use as an illuminating oil.

2. Burning test, hours (minimum) ..... * 16

3. Volatility:
   Flash point, degrees
   Fahrenheit (minimum) 100
   Distillation, degrees Fahrenheit:

	10 percent recovered (maximum)	401
	End point, (maximum)	572
4.	Sulfur, percent (maximum)	
	No. 1-K	0.04
	No. 2-K	0.30
5.	Color, Saybolt number, (minimum) (after heating 16 hours)	16
6.	Fluidity:	
	Freezing point, degrees Fahrenheit	-22
	Viscosity at 40 degrees Celsius	1.0 min/1.9 max

*After the first weighing, the rate of burning shall be 18 to 26 g/h. with the Institute of Petroleum (IP) burner. At the end of test the chimney shall be clear or only slightly clouded; the wick shall have no appreciable hard incrustation; at the end of test, the width of the flame may not vary by more than six millimeters, and the height of the flame may not have lowered by more than five millimeters from the respective measurements recorded at the start of the test.

History: Effective August 1, 1988; amended effective August 1, 1989.
General Authority: NDCC 19-10-10, 23-01-03(3)
Law Implemented: NDCC 19-10-10

33-34-01-04. Tractor fuel specifications. Tractor fuel specifications shall be as provided in this section.

Test	Light Grade
Distillation	
10 percent recovered degrees Fahrenheit maximum	347
95 percent recovered degrees Fahrenheit	465 to 518
Octane number American society for testing and materials motor method, minimum	35
Corrosion copper strip, maximum	No. 2
Sulfur percent, maximum	1.0

Test	Regular Grade
Distillation	
10 percent recovered degrees Fahrenheit	347 to 401
95 percent recovered degrees Fahrenheit	465 to 518
Octane number American society for testing and materials motor method, minimum	35
Corrosion, copper strip, maximum	No. 2
Sulfur percent, maximum	1.0

Tractor fuel may be colored green.

History: Effective August 1, 1988.
General Authority: NDCC 19-10-10, 23-01-03(3)
Law Implemented: NDCC 19-10-10

33-34-01-05. Heating oil specifications. Heating oil specifications are listed and described in the appendix to this chapter labeled North Dakota heating oil specifications.

History: Effective August 1, 1988.
General Authority: NDCC 19-10-10, 23-01-03(3)
Law Implemented: NDCC 19-10-10

33-34-01-06. Diesel fuel specifications. Diesel fuel specifications are listed and described in the appendix to this chapter labeled North Dakota diesel fuel specifications.

History: Effective August 1, 1988.
General Authority: NDCC 19-10-10, 23-01-03(3)
Law Implemented: NDCC 19-10-10

NORTH DAKOTA GASOLINE SPECIFICATIONS

TEST	MOTOR			
Water and Sediment.	None			
Color, Dye.	a			
Antiknock Compound g/gal. max	b			
Distillation Test				
10 percent Evap. degrees F. max . . .	122[c]	131[d]	140[e]	158[f]
50 percent Evap. degrees F. min . . .	170	170	170	170
50 percent Evap. degrees F. max . . .	230	235	240	250
90 percent Evap. degrees F. max . . .	365	365	365	374
End Point degrees F. max.	437	437	437	437
Residue percent max				2
Vapor Pressure g (Reid) lbs. max. . . .	15.0[c]	13.5[d]	11.5[e]	9.0[f]
Vapor/Liquid Ratio				
Minimum Test Temp. degrees F.	105[h]	116[i]	124[j]	133[k]
V/L max	20	20	20	20
Corrosion (copper strip) max.	No. 1			
Sulfur percent max (lead free gasolines)	0.1			
Sulfur percent max (leaded gasolines).	0.15			
Gum, mgs/100 ml max	5			
Knock Value				
Motor and Research Octane No., min. .	a			

NORTH DAKOTA GASOLINE SPECIFICATIONS (Continued)

TEST	STOVE AND LIGHT	AVIATION 80	AVIATION 100	AVIATION 100LL
Water and Sediment.	None			
Color Saybolt, min.	15			
Color, Dye.	None	Red(l)	Green	Blue
Dye Content				
Permissible blue dye (m) max. mg/gal		0.5	4.7	5.7
Permissible yellow dye (n) max. mg/gal		None	5.9	None
Permissible red dye (o) max. mg/gal		8.65	None	None
Antiknock Compound (p) ml/gal. max . . .	Trace	0.5(p)	4.0	2.0
Distillation Test				
10 percent Evap. degrees F. max . . .	158	167	167	167
50 percent Evap. degrees F. max . . .	266	221	221	221
90 percent Evap. degrees F. max . . .	365	275	275	275
End Point degrees F. max.	---	338	338	338
Sum of 10 and 50 degrees F Evap. Points degrees F. min	---	307	307	307
Distillation Recovery percent min . .	---	97	97	97
Residue percent max	2	1.5	1.5	1.5
Loss percent max.	---	1.5	1.5	1.5
Vapor Pressure (Reid) lbs. max.	10	7.0	7.0	7.0
min.	---	5.5	5.5	5.5
Corrosion (copper strip) max.	None	No. 1	No. 1	No. 1
Sulfur percent max (leaded gasolines).	---	0.05	0.05	0.05
Potential Gum (g) (5 hr. aging gum) max. mg/per 100 ml.	---	6	6	6
Freezing Point degrees F. max	---	-72	-72	-72
Net Heat of Combustion min. BTU/lb	---	18.720	18.720	18.720
Visible Lead Precipitate (r) max. mg/100 ml.	---	3	3	3
Water Reaction.	---	Volume change not to exceed (+)(-) 2 ml		
Permissible antioxidants (s) max. lb/1000 bbl.	---	4.2	4.2	4.2

Knock Value				
Octane Number Lean Rating, min. . . .	---	80	100	100
Octane Number Rich Rating, min. . . .	---	87	+	+
Performance number, min	---	---	130	130
Oxidation stability, Minutes min. . . .	480	---	---	---

FOOTNOTES TO NORTH DAKOTA GASOLINE SPECIFICATIONS

a. The minimum octane for premium gasoline shall be 91 as determined by the sum of the research method plus the motor method all divided by two ((R+M)/2). The minimum octane for super or midgrade gasoline shall be 89 as determined by the sum of the research method plus the motor method all divided by two ((R+M)/2). The minimum octane for leaded and unleaded gasoline shall be 87 as determined by the sum of the research method plus the motor method all divided by two ((R+M)/2). A person may not sell gasoline in any manner, including coloring, which deceives, tends to deceive, or has the effect of deceiving the purchaser as to grade or type.

b. The lead content of gasoline must be in accordance with environmental protection agency requirements.

c. Applies to gasoline sold during the months of January, February, March, November, and December.

d. Applies to gasoline sold during the months of March, April, October, and November.

e. Applies to gasoline sold from September sixteenth through the month of October.

f. Applies to gasoline sold during the months of April, May, June, July, and August and September first through September fifteenth. For the month of May, the specification only applies to gasoline and gasoline-oxygenate blend tankage at refineries, importers, pipelines, and terminals.

g. North Dakota and environmental protection agency regulations allow 1.0 pounds per square inch higher vapor pressure for gasoline-ethanol blends containing 9 to 10 volume percent ethanol for the same period.

h. Applies to gasoline sold during the months of January, February, March, November, and December.

i. Applies to gasoline sold during the months of March, April, May, October, and November.

j. Applies to gasoline sold during the months of June and October and during the period from September sixteenth through September thirtieth.

k. Applies to gasoline sold during the months of July, August, and September.

l. If mutually agreed upon between purchaser and supplier, grade 80 may be required to be free from tetraethyllead. In such case the fuel may not contain any dye and color may not be darker than +20 saybolt.

m. The only blue dye which may be present in the finished gasoline is essentially 1,4-dialkylaminoanthraquinone.

n. The only yellow dye which may be present in the finished gasoline is essentially p-diethylaminoazobenzene (Color Index No. 11020).

o. The only red dye which may be present in the finished gasoline is essentially methyl derivatives of azobenzene-4-azo-2-naphthol (methyl derivatives of Color Index No. 26105) or alkyl derivatives of azobenzene-4-azo-2-naphthol.

p. The tetraethyllead must be added in the form of an aviation antiknock mixture containing not less than 61 percent by weight of tetraethyllead and sufficient ethylene dibromide to provide two bromine atoms per atom of lead. The balance must contain no added ingredients other than kerosene, and approved inhibitors, and blue dye, as specified herein.

q. If mutually agreed upon between purchaser and supplier, aviation gasoline may be required to meet a sixteen-hour aging gum test instead of the five-hour aging gum test. In some cases the gum content may not exceed 10 mg per 100 ml and the visible lead precipitate may not exceed 4 mg per 100 ml. In such fuel the permissible antioxidants may not exceed 8.4 lb per 1000 bbl [42 gallons].

r. The visible lead precipitate requirement applies only to leaded fuels.

s. Permissible antioxidants are as follows:

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N,N’-diisopropyl-para-phenylenediamine
N,N’ di-secondary-butyl-para-phenylenediamine
2,4-dimethyl-6-tertiary-butylphenol
2,6-ditertiary-butyl-4-methylphenol
2,6-ditertiary butylphenol
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Mixed tertiary butylphenols, composition:

Seventy-five percent minimum 2,6 ditertiary butylphenol plus twenty-five percent maximum tertiary and tritertiary butylphenols.

NORTH DAKOTA HEATING OIL SPECIFICATIONS[a]

	No. 1	No. 2	No. 4 (Light)	No. 4	No. 5 (Light)	No. 5 (Heavy)	No. 6
	A distillate oil intended for vaporizing pot-type burners and other burners requiring this grade of fuel	A distillate oil for general purpose heating for use in burners not requiring No. 1 fuel oil	Preheating not usually required for handling or burning	Preheating not usually required for handling or burning	Preheating may be required depending on climate and equipment	Preheating may be required for burning and, in cold climates may be required for handling	Preheating required for handling and burning
Corrosion (Copper Strip) Maximum	No. 3	No. 3					
Flash Point (Tag closed tester) °F Minimum	100	100	100	130	130	130	140
Pour Point °F Maximum	0	20b	20	20			
Water and sediment percent maximum	0.05	0.05	0.50	0.50	1.00	1.00	2.00
Carbon Residue (On 10% Residuum) percent maximum	0.15	0.35					
Ash percent maximum			0.05	0.10	0.15	0.15	
Distillation Test:							
10% Recovered °F maximum	420	c					
90% Recovered °F maximum	550	640					
90% Recovered °F minimum		540d					
Viscosity at 100°F seconds							
Saybolt Universal, Minimum		32.6	32.8	45	>125	>300	> 900
Maximum		37.8	45	125	300	900	9000
Viscosity at 122°F Saybolt Furol							
Minimum						23	>45
Maximum						40	300
Viscosity at 100°F Kinematic Centistokes							
Minimum	1.4	2.0d	2.0	5.8	> 26.4	> 65	
Maximum	2.2	3.6	5.8	26.4	65	194	
Viscosity at 104°F Kinematic Centistokes							
Minimum						42	92
Maximum						81	638
Gravity °API Minimum	35	30	30 max				
Sulphur, percent maximum	0.5	0.5					

a. It is the intent of these classifications that failure to meet any requirement of a given grade does not automatically place an oil in the next lower unless in fact it meets all requirements of the lower grade.

b. Shall not exceed 0° whenever required by conditions of storage or use.

c. The 10% point shall be 440°F. maximum for use in other than atomizing burners.

d. When Pour Point less than 0°F. is specified, the minimum viscosity shall be 1.8cs. (32.0 seconds Saybolt Universal) and minimum 90% point shall be waived.

NORTH DAKOTA DIESEL FUEL SPECIFICATIONS

Grade of Diesel Fuel Oil	Flash Point degrees Centigrade	Cloud Point degrees Centigrade	Water and Sediment, percent by volume	Carbon Residue on 10% Residue, percent	Ash percent by weight	Distillation Temperatures Degrees Centigrade — 90 percent Point		Viscosity at 37.8°C Kinatic, centistoke for Saybolt Universal, sec.		Sulphur percent by weight	Copper strip Corrosion	Cetane Number c
	Min.	Max	Max.	Max.	Max.	Min.	Max.	Min.	Max.	Max.	Max.	Min.
No. 1-D Low Sulfur	38	a	0.05	0.15	0.01	---	288	1.3	2.4	0.05	No. 3	40d
No. 2-D Low Sulfur	52	a	0.05	0.35	0.01	282	338	1.9	4.1	0.05	No. 3	40d
No. 1-D	38	a	0.05	0.15	0.01	---	288	1.3	2.4 (34.6)	0.50	No. 3	40d
No. 2-D	52	a	0.05	0.35	0.01	282b	338	1.9b (33.6)	4.1 (40.1)	0.50	No. 3	40d
No. 4-D	55	a	0.05	---	0.10	---	---	5.5 (45)	24.0 (125)	2.0	---	30d

a. It is unrealistic to specify low temperature properties that will ensure satisfactory operation on a broad basis. Satisfactory operation should be achieved in most cases if the cloud point (or wax appearance point) is specified at 6°C above the tenth percentile minimum ambient temperature for the area in which the fuel will be used. Some equipment designs use flow improver additives, fuel properties, or operations, or a combination thereof, which may allow higher or require lower cloud point fuels. Appropriate low temperature operability properties should be agreed upon between the fuel supplier and purchaser for the intended use and expected ambient temperatures.

b. When cloud point less than -12.22°C is specified, the minimum viscosity shall be 1.7cs and the minimum 90 percent point shall be waived.

c. Where cetane number by Method D613 Test for Ignition Quality of Diesel Fuels by Cetane Method, is not available, Calculated Cetane Index may be used as an approximation. Where this is disagreement, Method D613 shall be the referee method.

d. Low atmospheric temperatures as well as engine operation at high altitudes may require use of fuels with higher cetane ratings.